

**PROCESS FOR PRODUCING A MATTRESS**

The present invention relates to the process for manufacturing a mattress, and especially to the manufacturing of mattresses consisting of elements of foam material containing a core of springs for example.

**Background of the invention**

Production of mattresses of the above type using liquid polyurethane in order to fasten the spring core to at least one opposite substrate area of polyurethane foam, in order to more rapidly produce such mattresses, is known in prior art from Danish Patent no. 146092 B.

From current production methods, it is known that this method can be employed by equipping one of the surfaces of the base piece with longitudinal streaks of liquid polyurethane, along the longitudinal edges of the base piece, onto which two longitudinal pieces of polyurethane foam are lowered and hardened. Thereafter, the area between the longitudinal pieces and the base piece is provided with the same substance onto which a spring core is lowered, as described in Danish Patent no. 146092 B. Finally, a top piece corresponding to the bottom piece is moulded in the same way, on top of the core and longitudinal pieces.

The result obtained is an unfinished mattress, lacking cross pieces in the short ends of the unfinished mattress. The cross pieces are manually thread into the openings between the bottom, top and longitudinal pieces and then glued to these edges with an adhesive. This task must be done very accurately, as the seams are especially subjected to strain during transport and use of the mattress. The manual process is consequently time consuming and expensive compared to an automated production line.

The glueing according to the present technique also has the disadvantage of seams consisting of two different materials, which will have a tendency to delaminate. The seams around the cross pieces therefore have the tendency  
5 to tear on such mattresses, even if the rest of the mattress is usable. Thus, this is a disadvantage for the user who must then send the mattress away for repair, or replace the mattress altogether, although it should not be necessary to do so given the condition of the other  
10 mattress parts.

There therefore exists a need for a process which makes it possible to produce mattresses of the above type in an automated manner, and wherein the seams of the pieces are of a strong and durable quality, and a quality that is as  
15 consistent as possible throughout the whole mattress.

#### **Object of the invention**

The object of the present invention is to provide a process for the manufacturing of mattresses which solves the above problems.

#### **20 Detailed description of the invention**

The present invention will be explained by reference to the attached Figures wherein:

Figure 1 depicts a perspective view of a base piece for a mattress.

25 Figure 2 depicts a perspective view of a base piece as well as side and cross pieces for a mattress.

Figure 3 depicts the pieces in Figure 2 and a core.

Figure 4 depicts a perspective view of a completed mattress.

The process according to the invention is characterised in that a joint material made of the same material as the pieces constituting the mattress is used, in all joints between the pieces which often are made of a foam material.

- 5 In this manner, the joint material melts/moulds the pieces together and the complete assemblage consists of one and the same material, thereby providing especially firm and solid joints.

10 It is, for example, common to use polyurethane foam sheets as outer parts for a mattress, and liquid polyurethane should therefore be used in order to mould/weld all the main parts together in the mattress construction.

The process of the present invention consists in this embodiment of the following steps:

- 15 (I) The bottom piece 1 is laid out as shown in Figure 1.
- (II) The moulding substance 2 is applied to the longitudinal edges and cross edges on one surface side of the bottom piece 1, for example by a robot.
- 20 (III) The longitudinal pieces 3 and cross pieces 4 are then lowered into the moulding substance 2 in their respective positions as shown in Figure 2, for example by a robot, and quickly becomes hardened.
- (IV) The moulding substance 5 is applied on the same surface side of the bottom piece between the side and end pieces, for example by a robot.
- 25 (V) A core 5, such as a core of springs, is lowered into the moulding substance 5 as shown in Figure 3, for example by a robot, and becomes quickly hardened.
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(VI). A top piece 6 is provided with moulding substance, corresponding to the moulding substance 2 and 5 applied to the bottom piece, turned with the moulding substance facing the open side of the almost completed mattress above, and placed onto the same as shown in Figure 4, for example by a robot.

In a modern production line, several of the above steps may of course be performed simultaneously or in another order.

For example, the application of moulding substance in steps II and IV are performed simultaneously in one embodiment, in order to increase the production speed. Thus, steps III and V, wherein the longitudinal pieces 3 and cross pieces 4, as well as the core 5 are lowered onto the base piece 1, may also be performed simultaneously in another embodiment, for the same reason.

It is therefore clear that the core 5 in alternative embodiments, may for example be lowered onto the base piece 1 simultaneously, during or after the lowering of the longitudinal pieces and cross pieces. The former pieces may likewise be lowered in an arbitrary order and possibly separately. This may for example be done if the base piece 1 is rotated through 90° turns in the surface plane, so that the longitudinal pieces and cross pieces are lowered one after the other successively or in pairs in time with the rotation of the base piece.

In the above described process, the corner joints between the side and cross pieces need not be provided with any moulding substance or glue. The bottom and top joints of the cross pieced achieved in the present process are thus

much stronger than allowed by gluing as according to prior art processes, in that they tolerate both higher loads and such loads over longer periods of time than previously. In

addition, a cover will provide further support when it is thread over the whole construction later in the production.

The pieces of the mattress are thereby held together with fewer and stronger joints than previously, making it possible to produce such mattresses faster and at more reasonable prices. The mattress without a cover thereby obtains a more attractive impression without disfiguring joints and glue spots.

However, if it should be desirable to close the mattress construction described above on the other hand, for example in order to avoid dust from entering into the construction during production and later use, the moulding substance may be injected manually or by the aid of an advanced robot into the corner joints between the cross and longitudinal pieces.

The process according to the present invention enables starting with a common production line for all mattresses which may later be divided into several lines for different qualities or semi-manufactured articles. More expensive components may then be inserted later in the process for example, and possibly custom adapted according to an ordering system.